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CENTRE CIRCULAR
NEWS FROM THE PROCESSING DEVELOPMENT DIVISION
FEBRUARY 2005

POTATOES: MUCH MORE THAN CARBOHYDRATES

Potatoes are a lot more than an excellent source of complex carbohydrates. In fact, new research is investigating whether some potato varieties have the ability to provide specific health benefits beyond basic nutritional functions. The staff at the Food Science and Technology Centre in Brooks are working closely with agronomists at the Crop Diversification Centre South to evaluate several interesting potato varieties.

"A medium-sized potato is approximately 78 percent water, 18 percent starch (complex carbohydrate), four percent protein and nutrients and contains only 100 calories," says Michele Konschuh, potato scientist, Crops Diversification Centre South, Brooks.

"Although potatoes contain carbohydrates, a medium potato has fewer grams of carbohydrate than a medium banana and approximately the same amount of carbohydrates found in two slices of whole wheat bread or one half cup of brown rice.

The nutritional composition of potatoes varies with variety and maturity.

"We are very interested in some of the yellow fleshed varieties," says Darcy Driedger, program manager at the Food Science and Technology Centre. "These potatoes contain yellow pigments belonging to a group of antioxidant compounds called carotenoids. Lutein and zeaxanthin are two such compounds found in many yellow fleshed varieties."

These two compounds are typically found in dark green leafy vegetables such as in spinach. However, the per capita consumption of potatoes is much greater than the per capita consumption of spinach. In fact, yellow-fleshed potato varieties may supply up to 10 per cent of the recommended daily value of total carotenoids.

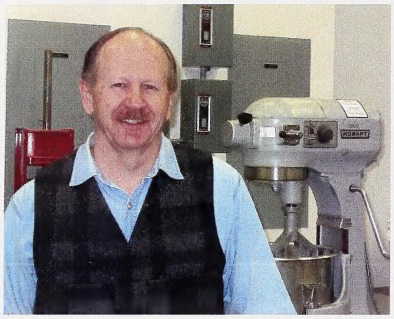
"Carotenoids protect against a variety of chronic diseases including cardiovascular disease and certain cancers," explains Konschuh. But perhaps the clearest link between specific carotenoids and a health outcome is that for lutein and zeaxanthin with age-related macular degeneration (AMD) which is the leading cause of visual impairment and blindness in the U.S.".

Alberta Agriculture, Food and Rural Development has co-sponsored a preliminary project to evaluate 20 yellow fleshed potato varieties available in Alberta for total carotenoid content and concentrations of lutein and zeaxanthin.

One of the aims of this research is to explore the potential of yellow-fleshed potatoes as functional foods. According to Health Canada, a functional food is similar in appearance to, or may be, a conventional food consumed as part of a usual diet, and, has been shown to have physiological benefits and/or reduce the risk of chronic disease beyond basic nutritional functions.

Three seed potato companies, Solanum International, HZPC Americas Corp. and Parkland Seed Potatoes, have provided seed and financial assistance for the project. Additional sponsors for the project include the Potato Growers of Alberta, ConAgra Foods, Maple Leaf Potatoes and McCain Foods.

Director's Message



Alberta's food processing industry has experienced many changes and challenges over the past year, with the bovine spongiform encephalopathy (BSE) issue being one of the most significant challenges. On a more positive note, the number of industry clients requesting assistance from the Processing Development Division has never been greater. Clearly the entrepreneurial attitude is alive and well in Alberta.

To date in 2004-05, the Division has processed over 150 applications for technical assistance for the development and manufacture of products ranging from condiments to high value ingredients from cereal grains. The number of days booked in our pilot plants has reached an all time high with three to four companies processing in our facilities on any given day. Currently, there are 30 companies using our pilot plants to manufacture products for retail or food service customers.

In addition to regular client services, a number of training programs and equipment demonstrations were completed including a pasteurizer operator's course and a home meal replacement seminar. Many of the Processing Development Division scientists were involved in research projects funded by industry associations or the Alberta Funding Consortium.

The expansion of the Food Processing Development Centre completed in 2002 has now been utilized to near capacity. Over the past year the design work for the Agrivalue Processing Business Incubator (Incubator) was completed and construction has begun. Hopefully, the construction of the Incubator will be nearing completion by the end of the 2005 calendar year. In addition to the construction, much still needs to be done. New staff are required, lease agreements developed, tenants recruited and business services established.

Over the past twelve months our Centre for Agri-Industrial Technology (CAIT) has emerged as a service provider for the development of industrial bio-products. A new manager with solid connections to the bio-processing industry was recruited and a joint appointment of a University of Alberta scientist established. It is expected that CAIT will provide a valuable service in developing the Agri-Industrial Initiative as part of AAFRD's growth strategy. Similar to the Incubator, much has yet to be done at CAIT over the next year. Additional staff and equipment will be required and an evaluation of suitable facilities completed.

The next year holds many challenges and opportunities for the Processing Development Division and Alberta's food processing industry. No doubt, our industry partners will rise to the challenge and push our Division to greater accomplishments in 2005.

Ron Pettitt, Director
Processing Development Division

NEW TO THE DIVISION

John Fallavollita, Branch Head, Centre for Agri-Industrial Technology

B.Eng and M.Eng in Metals and Materials Engineering, McGill University, Montreal
PhD in Chemical Engineering, McGill University, Montreal

Dr. John Fallavollita joined the Centre for Agri-Industrial Technology (CAIT) as the Branch Head in June of 2004. Prior to joining CAIT, Dr. Fallavollita spent 15 years in chemicals and materials science R & D with the Alberta Research Council, Sherritt, Noranda, and Dofasco.

For the past 3 years he was the founder and CEO of a renewable energy company in Burnaby, BC. He has also been involved for over 10 years as a finance and business development professional with the B.C. Government, Aquilan Research, and Merrill Lynch. He has received two US patents for technologies in advanced materials and chemical/energy recovery systems. The former patented technology has been licensed by two multinationals; Alcoa and Noranda.

Dr. Fallavollita's main areas of interest are in the strategic management of technology commercialization and the development of disruptive technologies. His primary focus at CAIT has been the development of a new Ag-Industrial cluster based on ethanol.

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John Fallavollita

NEW TO THE DIVISION

Tanya L. Ditschun, Food Scientist, Sensory Evaluation

B.Sc. Food Science, University of Guelph
M.S. Food Chemistry, University of California-Davis
Ph.D. Sensory Science, University of California-Davis

Dr. Ditschun joined the staff at the Food Processing Development Centre on October 1, 2004 as a sensory evaluation specialist. Prior to joining the Centre, Tanya managed sensory research for Senomyx Inc. of La Jolla, California, a biotechnology company using taste receptor based assays and technologies to discover flavours and flavour enhancers for the packaged food industry. Dr. Ditschun's successes included creating a sensory department, designing a new laboratory, and managing sensory research team members.

Dr. Ditschun also worked at Compusense Inc. of Guelph, Ontario, producer of data collection and analysis software used for sensory and consumer research world-wide. She is an active member of the Institute of Food Technologists, and is currently serving on the executive committee of the Marketing and Management Division.

Dr. Ditschun will bring knowledge of sensory evaluation methodology and practices to her current position. She will be working with clients across Alberta, assisting with sensory projects using trained and consumer research panels.

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Tanya Ditschun

HOME MEAL REPLACEMENT TECHNOLOGY AND MARKETING

The Home Meal Replacement (HMR) Technology and Marketing Seminar was held on November 23 & 24, 2004 and attracted 34 participants from both industry and government. The seminar's objective was to inform the industry about current HMR product trends, new and upcoming HMR technologies and market opportunities in the North American marketplace.

Dr. David Hughes from Imperial College, London, England shared his expertise in the area of HMR marketing. He discussed the trends in the United Kingdom and how he felt they were relevant in North America. Speakers from Alberta Agriculture and Alberta Economic Development gave presentations on the products and concepts that they had seen on their recent trips to Europe as well as market information available on products in North America.

The technical portion of the program began with presentations on regulatory and microbiological concerns in HMR production. Demonstrations of HMR processing equipment including: the Multivac tray sealer, the Blentech cooker, the meatball former and the Multifill volumetric filler were given at the Food Processing Development Centre (FPDC). Multivac and Blentech representatives were onsite to present information on their equipment and assist the FPDC staff with the equipment demonstrations.

Dr. Daniel Farkas, from Elmhurst Technologies, presented an overview of High Pressure Processing (HPP). This technology is being evaluated by industry worldwide to create high quality shelf stable products without traditional high temperature preservation processes.

The overall response to this Seminar was excellent. Industry feedback is currently being collected and evaluated in order to determine priorities Alberta Agriculture needs to take to build the HMR category in the North American context.

This seminar was funded in part by Agriculture & Agri-Food Canada.

If you are interested in receiving information on any of the presentations or companies at the seminar please contact Kathleen Bunnin at 780-980-4721 or email kathleen.bunnin@gov.ab.ca.

Dr. Dan Farkas speaks on HPP at the Home Meal Replacement Technology & Marketing Seminar

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Biorefining At The Centre For Agri-industrial Technology

With the establishment of the Centre for Agri-Industrial Technology (CAIT) as a separate branch within the Processing Development Division, a new chapter has begun in the continuing story of agricultural development in Alberta. Together with the food-based activities at the Food Processing Development Centre in Leduc and the Food Science and Technology Centre in Brooks, the Division will now be expanding its scope with new facilities and staff that have capabilities in the areas of chemical and biochemical process engineering.

The business objective for CAIT will be to provide companies with facilities and staff to integrate their technologies with the agricultural feedstock options in Alberta. CAIT staff will work closely with crop and meat specialists as well as economic development staff to make Alberta the preferred choice for the development and manufacture of new Ag-Industrial products.

The first cluster of activity that CAIT will focus on is the biorefining of various plants and straws.

What is Biorefining?

Biorefining is a process methodology that aims to recover 100 percent of the agricultural feedstock as valuable products. Biorefining should not be confused with the practice of extracting small quantities of valuable compounds from plants and discarding the rest. The challenge in biorefining is to scientifically design and engineer sophisticated processes to recover or convert all of the starting material.

What products can be produced from Biorefineries?

The feedstocks for the biorefineries developed at CAIT will come from such sources as cereal straws, barley/oats, and canola oil. Through the appropriate integration of several process technologies these feedstocks can be converted to a number of valuable products including, but not limited to: bioethanol, lignin, xylitol, beta-glucan, phytosterols, and bioplastics.

CAIT has entered into discussions with several companies to build a cluster of activity centred on biorefining at the pre-commercial scale. These companies include players in various markets such as: energy, functional foods, natural health products, and adhesives. Together with Dr. Suresh Narine, University of Alberta, and backed by a number of major companies, CAIT is also working on technology to produce plastics from canola oil.

Upcoming Events

April 19-22, 2005
MILK PASTEURIZATION AND PROCESS OPERATION LICENSING COURSE
This course gives participants an overview of the concepts of pasteurization, equipment, fail-safe devices, functions and regulatory application, design and function as related to time, temperature and pressure. The four-day program includes hands-on activities, discussions and lectures on regulations, cleaning and sanitation, pasteurization, and other operational procedures in milk plants. For more information contact Jacqueline Martin-Lopez, 780-980-4867 or jacqueline.martin.lopez@gov.ab.ca

April 26 & 27, 2005
SAUSAGE AND PROCESSED MEATS SHORT COURSE (Level 1)
This course is designed to give participants a basic overview of the ingredients and technologies used in the production of sausage and processed meats. For more information contact Kathleen Bunnin, 780-980-4721 or kathleen.bunnin@gov.ab.ca

Did You Know?

The Alberta Agriculture, Food and Rural Development Website is called "Ropin' the Web" and can be found at www.agric.gov.ab.ca. It has information and explanations about the many programs and services that AAFRD has available.